General

Title

Perinatal care: proportion of nosocomial bacterial infection for eligible infants whose birth weight is between 401 and 1500 grams or whose gestational age is between 22 and 29 weeks.

Source(s)

Vermont Oxford Network. Late sepsis or meningitis in VLBW neonates (risk adjusted). Burlington (VT): Vermont Oxford Network; 2015. 7 p.

Measure Domain

Primary Measure Domain

Clinical Quality Measures: Outcome

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the proportion of nosocomial bacterial infection for eligible infants whose birth weight is between 401 and 1500 grams or whose gestational age is between 22 and 29 weeks.

Rationale

Infection in very low birth weight (VLBW) infants increases risk of mortality, length of hospital stay, and cost of care. Additionally, neonatal infections among extremely low birth weight infants are associated with poor neurodevelopmental and growth outcomes in early childhood (Stoll et al., 2004). While early-onset sepsis rates have been reduced by advances in obstetric care, late-onset sepsis rates have increased with improved survival of preterm infants (Dong & Speer, 2015), and risk for late sepsis increases with decreased birth weight and gestational age (Stoll et al., 2002). The American Academy of Pediatrics outlined strategies to prevent late-onset infections (Polin et al., 2012), including hand hygiene, following Healthcare Infection Control Practices Advisory Committee (HICPAC) guidelines for prevention of

intravascular catheter-related infections (O'Grady et al., 2011), and adapting Centers for Disease Control and Prevention (CDC) pneumonia prevention guidelines (Tablan et al., 2004) to be used for ventilated neonatal intensive care (NICU) patients.

Evidence for Rationale

Dong Y, Speer CP. Late-onset neonatal sepsis: recent developments. Arch Dis Child Fetal Neonatal Ed. 2015 May;100(3):F257-63. PubMed

O'Grady NP, Alexander M, Burns LA, Dellinger EP, Garland J, Heard SO, Lipsett PA, Masur H, Mermel LA, Pearson ML, Raad II, Randolph AG, Rupp ME, Saint S, Healthcare Infection Control Practices Advisory Committee. Guidelines for the prevention of intravascular catheter-related infections. Am J Infect Control. 2011 May;39(4 Suppl 1):S1-34. PubMed

Polin RA, Denson S, Brady MT, Committee on Fetus and Newborn, Committee on Infectious Diseases. Strategies for prevention of health care-associated infections in the NICU. Pediatrics. 2012 Apr;129(4):e1085-93.

Stoll BJ, Hansen N, Fanaroff AA, Wright LL, Carlo WA, Ehrenkranz RA, Lemons JA, Donovan EF, Stark AR, Tyson JE, Oh W, Bauer CR, Korones SB, Shankaran S, Laptook AR, Stevenson DK, Papile LA, Poole WK. Late-onset sepsis in very low birth weight neonates: the experience of the NICHD Neonatal Research Network. Pediatrics. 2002 Aug;110(2 Pt 1):285-91. PubMed

Stoll BJ, Hansen NI, Adams-Chapman I, Fanaroff AA, Hintz SR, Vohr B, Higgins RD, National Institute of Child Health and Human Development Neonatal Research Network. Neurodevelopmental and growth impairment among extremely low-birth-weight infants with neonatal infection. JAMA. 2004 Nov 17;292(19):2357-65. PubMed

Tablan OC, Anderson LJ, Besser R, Bridges C, Hajjeh R, Centers for Disease Control and Prevention (CDC), Healthcare Infection Control Practices Advisory Committee. Guidelines for preventing health-care--associated pneumonia, 2003: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee. MMWR Recomm Rep. 2004 Mar 26;53(RR-3):1-36. PubMed

Vermont Oxford Network. Late sepsis or meningitis in VLBW neonates (risk adjusted). Burlington (VT): Vermont Oxford Network; 2015. 7 p.

Primary Health Components

Perinatal care; nosocomial bacterial infection; very low birth weight (VLBW) infants

Denominator Description

All eligible infants in the reporting hospital after day 3 of life or readmitted after day 3 of life should be included if they meet either of the following two criteria:

> Any infant who is born at the reporting hospital and whose birth weight is between 401 and 1500 grams OR whose gestational age is between 22 weeks 0 days and 29 weeks 6 days (inclusive) should be included, regardless of where in the hospital the infant receives care.
> Any outborn infant who is admitted to any location in the reporting hospital within 28 days of birth, without first having gone home, and whose birth weight is between 401 and 1500 grams OR whose gestational age is between 22 weeks 0 days and 29 weeks 6 days (inclusive) should be included, regardless of where in the hospital the infant receives care.

See the related "Denominator Inclusions/Exclusions" field.

Numerator Description

Number of eligible infants who had nosocomial bacterial infection after day 3 of life and prior to discharge home (see the related "Numerator Inclusions/Exclusions" field)

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Additional Information Supporting Need for the Measure

Unspecified

Extent of Measure Testing

Unspecified

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Hospital Inpatient

Intensive Care Units

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Single Health Care Delivery or Public Health Organizations

Statement of Acceptable Minimum Sample Size

Unspecified

Target Population Age

Gestational age between 22 and 29 weeks

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Aim

Better Care

National Quality Strategy Priority

Health and Well-being of Communities
Making Care Safer
Prevention and Treatment of Leading Causes of Mortality

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Safety

Data Collection for the Measure

Case Finding Period

Calendar year (January 1 through December 31)

Denominator Sampling Frame

Patients associated with provider

Denominator (Index) Event or Characteristic

Clinical Condition

Institutionalization

Patient/Individual (Consumer) Characteristic

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions
All eligible infants in the reporting hospital after day 3 of life or readmitted after day 3 of life should be included if they meet either of the following two criteria:

- Any infant who is born at the reporting hospital and whose birth weight is between 401 and 1500 grams OR whose gestational age is between 22 weeks 0 days and 29 weeks 6 days (inclusive) should be included, regardless of where in the hospital the infant receives care.
- Any outborn infant who is admitted to any location in the reporting hospital within 28 days of birth, without first having gone home, and whose birth weight is between 401 and 1500 grams OR whose gestational age is between 22 weeks 0 days and 29 weeks 6 days (inclusive) should be included, regardless of where in the hospital the infant receives care.

Note: Refer to the original measure documentation for calculation instructions and data item definitions. For administrative coding and additional data item information, refer to the *2016 Manual of Operations: Part 2 Data Definitions & Infant Data Forms* (see the "Companion Documents" field).

Exclusions

- Infants who meet neither of the above two criteria.
- Outborn infants admitted more than 28 days after birth.
- Outborn infants who have been home prior to admission.
- Infants discharged home on or before day 3 of life.
- Infants who die on or before day 3 of life.
- Infants who transfer to another hospital on or before day 3 of life and who are not readmitted to the reporting hospital.

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions
Number of eligible infants who had nosocomial bacterial infection after day 3 of life and prior to discharge

home

Note:

> *Nosocomial Infection*: Either coagulase negative staphylococcus and/or an identified bacterial pathogen after day 3 of life.
> Infants with coagulase negative staphylococcus infection must have all three of the following: positive blood or cerebrospinal fluid culture; one or more signs of generalized infection; treatment with five or more days of intravenous antibiotics.
> Refer the original measure documentation for additional information, including a complete list of bacterial pathogens.

Exclusions

Unspecified

Numerator Search Strategy

Institutionalization

Data Source

Administrative clinical data

Electronic health/medical record

Paper medical record

Type of Health State

Adverse Health State

Instruments Used and/or Associated with the Measure

Unspecified

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Rate/Proportion

Ratio

Interpretation of Score

Desired value is a lower score

Allowance for Patient or Population Factors

not defined yet

Description of Allowance for Patient or Population Factors

Late sepsis or meningitis in very low birth weight (VLBW) neonates is a measure of nosocomial bacterial infection for eligible infants whose birth weight is between 401 and 1500 grams or whose gestational age is between 22 and 29 weeks. Coefficients from the Vermont Oxford Network are provided on request to hospitals that wish to determine observed and expected values based on case mix for a given period (usually a year). The observed and expected values may be used to calculate hospital performance measures such as the standardized morbidity ratio, the standardized rate, or observed minus expected values. The coefficients are based on a multivariable logistic regression model which includes birth location and factors present at birth that may be associated with infection.

A measure of systematic variation among hospitals in the Vermont Oxford Network is also available on request to provide a means to adjust for random variation using a process referred to as shrinkage. Shrinkage formulas are described in the original measure documentation in the section labeled 'Calculation Instructions.' When the shrinkage formulas are applied, the hospital performance measure values move closer to the population mean in proportion to the imprecision of the estimate, i.e., in inverse proportion to the number of cases. Shrunken estimates are a weighted average of the hospital value and the population (Vermont Oxford Network) mean value. In small hospitals shrunken estimates will weight the population mean value more heavily, whereas the calculated performance measure value will be weighted more heavily in larger hospitals. Shrunken estimates are more stable over time than if the correction were not applied, because they adjust for imprecision by filtering random variation.

Measure Stratification: Covariates associated with predicting the expected value are included in the multivariable model.

The covariates include:

- Gestational age in completed weeks (GA)
- GA squared
- Small for gestational age
- Major birth defect
- APGAR score at 1 minute (0 to 10)
- Birth location
- Multiple gestation
- Infant gender
- Mode of delivery

Refer to the original measure documentation for additional information.

Standard of Comparison

not defined yet

Identifying Information

Original Title

Late sepsis or meningitis in VLBW neonates (risk adjusted).

Measure Collection Name

Perinatal Care Measures

Submitter

Vermont Oxford Network - Health Care Quality Collaboration

Developer

Vermont Oxford Network - Health Care Quality Collaboration

Funding Source(s)

None

Composition of the Group that Developed the Measure

Neonatologists

Financial Disclosures/Other Potential Conflicts of Interest

None

Endorser

National Quality Forum - None

NQF Number

not defined yet

Date of Endorsement

2014 Nov 3

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2015 Jan

Measure Maintenance

Unspecified

Date of Next Anticipated Revision

2016 May 2

Measure Status

This is the current release of the measure.

Measure Availability

Source not available electronically.

For more information, contact the Vermont Oxford Network, 33 Kilburn Street, Burlington, Vermont, 05401; Phone: 802-865-4814; Fax: 802-865-9613; Email: mail@vtoxford.org; Web site: https://public.vtoxford.org/ .

Companion Documents

The following is available:

> Vermont Oxford Network. 2016 manual of operations: part 2 data definitions & infant data forms. Release 20.0. Burlington (VT): Vermont Oxford Network; 2015 Oct. 93 p. This document is available from the Vermont Oxford Network Web site .

NQMC Status

This NQMC summary was completed by ECRI Institute on February 2, 2016. The information was verified by the measure developer on March 16, 2016.

Copyright Statement

Production

Source(s)

Vermont Oxford Network. Late sepsis or meningitis in VLBW neonates (risk adjusted). Burlington (VT): Vermont Oxford Network; 2015. 7 p.

Disclaimer

NQMC Disclaimer

The National Quality Measures Clearinghouseâ„¢ (NQMC) does not develop, produce, approve, or endorse the measures represented on this site.

All measures summarized by NQMC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public and private organizations, other government agencies, health care organizations or plans, individuals, and similar entities.

Measures represented on the NQMC Web site are submitted by measure developers, and are screened solely to determine that they meet the NQMC Inclusion Criteria.

NQMC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or its reliability and/or validity of the quality measures and related materials represented on this site. Moreover, the views and opinions of developers or authors of measures represented on this site do not necessarily state or reflect those of NQMC, AHRQ, or its contractor, ECRI Institute, and inclusion or hosting of measures in NQMC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding measure content are directed to contact the measure developer.